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## **Compilation of information on mitigation benefits of actions, initiatives and options to enhance mitigation ambition**

### **Technical paper**

#### *Summary*

This technical paper compiles information on the mitigation benefits of actions, initiatives and options to enhance mitigation ambition identified in the submissions by Parties and accredited observer organizations submitted to the secretariat under the Ad Hoc Working Group on the Durban Platform for Enhanced Action (ADP) workstream 2, on pre-2020 ambition. In their submissions, Parties highlighted their efforts in implementing emission reduction pledges by 2020, national actions and their mitigation and adaptation benefits, incentives, and barriers to actions and ways to overcome them. For developing countries, the provision of financial, technological and capacity-building support is deemed essential for the implementation of their pledges. Cooperative initiatives that bring together different stakeholder groups across a number of thematic areas can contribute to enhancing Parties' efforts towards the implementation of the pledges. In their submissions, Parties referred to a number of thematic areas with a high mitigation potential in which further action by 2020 could help to narrow the emissions gap. They acknowledged the role that the ADP can play in assisting Parties in enhancing ambition through technical work and work at the political level by 2015, with a focus on 2013.

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## I. Executive summary

1. At the second part of its first session, under workstream 2, relating to pre-2020 ambition, the Ad Hoc Working Group on the Durban Platform for Enhanced Action (ADP) invited Parties and accredited observer organizations to submit to the secretariat information, views and proposals on actions, initiatives and options to enhance ambition, including through the workplan on enhancing mitigation ambition, with a particular focus on 2013.<sup>1</sup> Parties were also invited to give consideration to the following aspects: mitigation and adaptation benefits, including resilience to the impacts of climate change; barriers and ways to overcome them, and incentives for actions; and finance, technology and capacity-building to support implementation.<sup>2</sup>

2. The ADP requested the secretariat to prepare a technical paper compiling information on the mitigation benefits of the actions, initiatives and options to enhance mitigation ambition identified in the submissions referred to in the paragraph above.<sup>3</sup> The information contained in this technical paper can inform the ADP in its consideration of possible action to be taken by the Conference of the Parties (COP) at its nineteenth session.

3. Many Parties to the Convention made conditional and unconditional emission reduction pledges by 2020 under the Cancun Agreements.<sup>4</sup> For developed countries, these pledges encompass quantified economy-wide emission reduction targets under the Convention for all developed countries and quantified emission limitation or reduction commitments under the second commitment period of the Kyoto Protocol by developed countries assuming commitments for this period.<sup>5</sup> For developing countries, these pledges are in the form of nationally appropriated mitigation actions.

4. There is a recognition that the full implementation of these pledges can bring sizeable emission reductions and that rapid progress has been made by many Parties recently in taking action and implementing policies to underpin these pledges. However, a significant gap remains between the expected aggregate emission reduction effect of Parties' pledges in terms of global annual emissions by 2020 and aggregate emission pathways consistent with the likely chance of holding the increase in global average temperature below 2 °C (the 2 °C goal) or 1.5 °C above pre-industrial levels. The emission gap is estimated to range between 8 to 13 billion tonnes of carbon dioxide equivalent (Gt CO<sub>2</sub> eq) in 2020.<sup>6</sup> Parties recognized the urgent need to step up their mitigation action to ensure the highest possible mitigation effort and that the remaining time to close the gap by 2020 is reducing.

5. There is a sizable technical potential to close the ambition gap and the ADP can have a major role in assisting Parties to step up their efforts in closing this gap. In their submissions Parties highlighted areas of sizeable mitigation potential by 2020 and emphasized mitigation and adaptation benefits of actions, including resilience to the impacts of climate change as well as the environmental, economic and social aspects of sustainable development in the context of such action that could help Parties build national support for stronger action.

<sup>1</sup> FCCC/ADP/2012/3, paragraph 31.

<sup>2</sup> Submissions made by Parties are available at <<http://unfccc.int/bodies/awg/items/7398.php>> and made by non-governmental organizations are available at <[http://unfccc.int/parties\\_observers/ngo/submissions/items/3689.php](http://unfccc.int/parties_observers/ngo/submissions/items/3689.php)>.

<sup>3</sup> FCCC/ADP/2012/3, paragraph 33.

<sup>4</sup> FCCC/SB/2011/INF.1/Rev.1 and FCCC/SBI/2013/INF.12/Rev.1.

<sup>5</sup> Decision 1/CMP.8, annex I.

<sup>6</sup> UNEP, 2012.



6. Parties acknowledged barriers, such as political, economic, institutional, information and capacity, as a major impediment in taking further action. They also acknowledged that setting the right incentives and policies and the provision of financial, technological and capacity-building support for developing countries could help to address the barriers to mitigation actions and can lead to stronger action at all levels. An array of existing national policies, including best practices and success stories, in setting performance standards, building codes, eco-labelling, market-based mechanisms, carbon taxes, air pollution charges, monitoring and regulations, were highlighted in Parties' submissions.

7. The efforts to enhance mitigation ambition are also supported through the cooperative initiatives implemented at all levels and across various thematic areas.<sup>7</sup> The range of the initiatives referred to in the submissions is very broad in terms of coverage of purpose (e.g. leading to political dialogue or focused on implementation), participation (e.g. involving the public and private sectors, cities or local governments), geographical coverage (e.g. regional or international), and thematic coverage (e.g. energy efficiency or waste).<sup>8</sup>

8. In addition to emission reductions, the initiatives could bring benefits such as reductions in air pollutant emissions, promotion of low-emission development opportunities, economic growth and additional motivation for political and substantive engagement of various stakeholders. While the cooperative initiatives could provide added value to Parties' actions and bring sizeable emission reductions, their mitigation impact is not strictly additive to the emission reduction pledges under the Cancun Agreements, as the mitigation impact of the initiatives and national mitigation actions partly overlap. It was highlighted by some Parties that any cooperative initiatives that may facilitate action by developing countries should not impose on them new or additional commitments.

9. Some of the frequently mentioned initiatives include the Low Emission Development Strategies (LEGS) Global Partnership, the United National Collaborative Programme on Reducing Emissions from Deforestation and Forest Degradation in Developing Countries (UN-REDD programme), REDD-plus Partnership,<sup>9</sup> the Secretary-General's Sustainable Energy for All, and the Climate and Clean Air Coalition to Reduce Short-Lived Climate Pollutants (CCAC), which involve a large number of countries and stakeholders, including the private sector, academia, subnational actors and communities.

10. Parties' submissions suggest that there are many opportunities that could be employed and scaled up across a range of thematic areas with a high mitigation potential prior to 2020. The thematic areas and their mitigation potentials by 2020 have been identified as follows: energy efficiency (around 2 Gt CO<sub>2</sub> eq); renewable energy (around 1 to 2.5 Gt CO<sub>2</sub> eq); fossil fuel subsidy reform (1.5 to 2 Gt CO<sub>2</sub> eq); reduction of emissions from fluorinated greenhouse gases (GHGs) (0.5 Gt CO<sub>2</sub> eq); reducing short-lived climate pollutants (1 Gt CO<sub>2</sub> eq); transport (total 1.7 to 2.5 Gt CO<sub>2</sub> eq, which includes shipping and aviation potential estimated at 0.3 to 0.5 Gt CO<sub>2</sub> eq); land use, including forestry (1.3 to 4.2 Gt CO<sub>2</sub> eq) and agriculture (1.1 to 4.3 Gt CO<sub>2</sub> eq); and waste (around 0.8 Gt CO<sub>2</sub> eq).<sup>10</sup>

<sup>7</sup> A list of selected cooperative initiatives that is accompanied by a description and a summary of the type, coverage and participation is presented at the UNFCCC website <[http://unfccc.int/meetings/bonn\\_jun\\_2013/items/7655.php](http://unfccc.int/meetings/bonn_jun_2013/items/7655.php)>.

<sup>8</sup> Weischer and Morgen. 2012. Blok et al. 2012.

<sup>9</sup> Policy approaches and positive incentives on issues relating to reducing emissions from deforestation and forest degradation in developing countries; and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries.

<sup>10</sup> Mitigation potential estimates for energy efficiency and renewable energy are from IEA 2012. Mitigation potential estimates for fossil fuel subsidy reform are from IMF 2013. Mitigation potential estimates for reducing emissions from fluorinated GHGs and reducing short-lived climate pollutants are from UNEP 2011c. Mitigation potential estimates for transport, land use and waste are from



11. Successful implementation of national action by developing countries is linked by many Parties to access to financial, technological and capacity-building support. For many Parties, enhanced delivery of financial support is linked in turn to transparency of financial flows and identification of sources and ways to attract financing to developing countries. The operationalization and capitalization of the institutions under the Convention, such as the Green Climate Fund, the Adaptation Fund and the nationally appropriate mitigation action (NAMA) registry, were recognized as options to facilitate the provision of enhanced financial, technological and capacity-building support for developing countries and to catalyse the necessary paradigm shift.

12. Preparation by developed countries of a road map for financial support and ways to increase it was seen as a way to support enhanced mitigation and adaptation actions by developing countries. The technology needs assessment and technology road maps could be instrumental in facilitating technology development and transfer in developing countries. Addressing key barriers to technology development and transfer, such as intellectual property rights (IPRs) and capitalization of the Technology Mechanism, is viewed by many Parties as critical to enabling enhanced actions by developing countries. The importance of capacity-building support was also recognized.

13. Several Parties expressed the view that Parties should be guided by the objective and principles of the Convention and that developed countries should take a lead in implementing their existing commitments by 2020 in relation to emission reductions as well as the provision of financial, technological and capacity-building support. It was highlighted that any cooperative initiatives that may facilitate action by developing countries should not impose on them new or additional commitments.

14. On the way forward to enhancing the pledges, many submissions called on Parties to continue clarification of their pledges through accurate analysis of pledges and emission trends, and to recognize Parties' efforts and actions to implement pledges under the Convention through sharing information on best practices, success stories and examples of leadership. Once clarified and recognized, the pledges and actions could be assessed under the monitoring, reporting and verification system under the Convention.

15. Two sets of options under the ADP workplan on enhancing mitigation ambition were identified in the submissions. The first set of options, that is on enhancing the ambition of pledges, includes: a call by the ADP for Parties to address the conditions associated with their pledges; to broaden the scope of pledges; to adhere to strict accounting rules; to invite Parties that have not made emission reduction pledges to do so; and to invite all Parties to make new, more ambitious pledges. A call to ratify the amendment to the Kyoto Protocol as a matter of urgency is another option proposed by some Parties. The second set of options, that is on ambition of mitigation actions and of financial, technological and capacity-building support, encompasses actions relating to identification of the best practice national actions, assessment of the ways to provide enhanced financial, technological and capacity-building support to developing countries, and recognition of cooperative initiatives and their role in catalysing action towards increasing the ambition.

16. To advance under ADP workstream 2 it was proposed by a number of Parties that the ADP undertake technical work and work at the political level up to 2015, covering, in a comprehensive manner, mitigation, adaptation and support. Technical work by the ADP was deemed essential by many Parties to build momentum towards taking enhanced action at the political level for preparation of the 2015 agreement.

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UNEP 2012. Some estimates are probably underestimated compared with the others, owing to the use of different sources and methodologies, and potential values are not strictly comparable and they are not additive, as they partly overlap.



## II. Background

### A. Mandate

17. At the first part of its first session, the ADP adopted its agenda and initiated two workstreams, one addressing matters related to paragraphs 2–6 of decision 1/CP.17 (the 2015 agreement) and the second addressing matters related to paragraphs 7 and 8 of the same decision (pre-2020 ambition).

18. At the second part of its first session, the ADP through its conclusions, under its workstream 2, invited Parties and accredited observer organizations to submit to the secretariat, by 1 March 2013, information, views and proposals on actions, initiatives and options to enhance ambition, including through the workplan on enhancing mitigation ambition, with a particular focus on 2013.<sup>11</sup> It suggested that, in their submissions on actions, initiatives and options to enhance ambition, Parties may wish to give consideration to the following aspects:

- (a) Mitigation and adaptation benefits, including resilience to the impacts of climate change;
- (b) Barriers and ways to overcome them, and incentives for actions;
- (c) Finance, technology and capacity-building to support implementation.<sup>12</sup>

19. In addition, the ADP requested the secretariat to prepare a technical paper compiling information on the mitigation benefits of actions, initiatives and options to enhance the mitigation ambition identified in the submissions referred to in paragraph 18 above, and to make the first version of the technical paper available before its session to be held in conjunction with the thirty-eighth sessions of the Subsidiary Body for Implementation and the Subsidiary Body for Scientific and Technological Advice.<sup>13</sup>

20. By its conclusions at the same session, the ADP stated its intention to hold in-session round-table discussions and workshops and invited the Co-Chairs of the ADP to set out, in early 2013, focused questions for those round-table discussions and workshops, taking into account the submissions referred above.<sup>14</sup> This technical paper, therefore, includes, in addition to the compilation of submissions referred to in paragraph 18 above, contributions by Parties and initiatives provided at the workshops on low-emission development opportunities, and opportunities for mitigation and adaptation related to land use held during the first part of the second session of ADP held in Bonn, Germany, on 30 April and 1 May 2013.<sup>15</sup>

<sup>11</sup> FCCC/ADP/2013/2, paragraph 31.

<sup>12</sup> Submissions under ADP workstream 2 made by Parties are available at <<http://unfccc.int/bodies/awg/items/7398.php>> and made by non-governmental organisation are available at <[http://unfccc.int/parties\\_observers/ngo/submissions/items/3689.php](http://unfccc.int/parties_observers/ngo/submissions/items/3689.php)>.

<sup>13</sup> FCCC/ADP/2013/2, paragraph 33.

<sup>14</sup> FCCC/ADP/2013/2, paragraph 32.

<sup>15</sup> Information on the workshops held under ADP workstream 2 during the first part of the second session is available at <[http://unfccc.int/meetings/bonn\\_apr\\_2013/workshop/7489.php](http://unfccc.int/meetings/bonn_apr_2013/workshop/7489.php)> and <[http://unfccc.int/meetings/bonn\\_apr\\_2013/workshop/7490.php](http://unfccc.int/meetings/bonn_apr_2013/workshop/7490.php)>.



## B. Objective and approach

21. In accordance with the mandate, the objective of the first version of the technical paper is to compile information on the mitigation benefits of actions, initiatives and options to enhance mitigation ambition in order to support the negotiation process under workstream 2 of the ADP. This technical paper is based on the 32 submissions that were made, including the 24 submissions by Parties or groups of Parties and the eight submissions by observer organizations.

22. The approach used in compiling the information in this technical paper is largely defined by the information contained and referred to in these submissions and does not suggest a consensus among Parties on various issues and options that are presented. The technical paper presents information on the mitigation benefits of national actions and cooperative initiatives grouped by key thematic areas with a high mitigation potential identified in the submissions, such as the promotion of energy efficiency, increasing the global share of renewable energy, supporting fossil fuel subsidy reform, reduction of short-lived climate pollutants, reduction of fluorinated GHG emissions, transport, land use and waste. For each thematic area, it describes the mitigation potential and benefits, barriers and incentives for mitigation actions and provides examples of national actions and cooperative initiatives. It also presents information on finance, technology and capacity-building to support the implementation of the emission reduction pledges by developing countries.

23. To facilitate the understanding of the mitigation benefits of actions, in this technical paper the term “mitigation benefits of actions” is defined as benefits associated with the actions and initiatives that result in reducing GHG emissions. Based on the submissions, this technical paper takes a broad definition of the mitigation benefits of actions and initiatives, to include the following:

- (a) Potential GHG emission reductions;
- (b) Contributions to long-term transformational change, for example technology development that will enable deep emission reductions in the future;
- (c) Mitigative capacity, which covers the social, political, institutional and economic structures and conditions that are required for effective mitigation;<sup>16</sup>
- (d) Other benefits of the actions that are not directly related to reducing GHG emissions but could contribute to sustainable development goals, including poverty eradication, economic development, environmental protection, reduction of local air pollution or increased energy security. In some cases these benefits are not really co-benefits, but are the main drivers of the activity, with mitigation being the co-benefit;
- (e) The avoided adaptation need at the global level owing to emission reduction and the associated limit to the global temperature increase.

24. The submissions also included some information on the adaptation benefits of actions and initiatives, for example food security, natural resource management and environment protection, which are also compiled in this technical paper.

25. In addition to the information on the national actions for enhancing ambition, this technical paper presents information on cooperative initiatives that could support Parties in

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<sup>16</sup> Yohe. 2001.



implementing such actions and could potentially assist Parties to go beyond the existing emission reduction pledges.<sup>17</sup>

26. This technical paper is largely based on information referred to in the submissions, and to a certain extent on the reports published by the United Nations Environment Programme (UNEP) and specialized international organizations, such as the International Energy Agency (IEA), International Monetary Fund (IMF) and International Labour Organization (ILO), that were referred to by a number of Parties in their submissions.

### **C. Structure of the technical paper**

27. This technical paper comprises an executive summary, a background and a description of its mandate (chapter II) and four substantive chapters. It starts with an overview of the existing emission reduction pledges made by developed and developing countries under the Cancun Agreements and the emissions gap (chapter III). It then provides a compilation of information on mitigation potential, benefits, barriers and incentives, and provides examples of national policies and cooperative initiatives grouped by key thematic areas with a high mitigation potential (chapter IV). This technical paper also provides views on finance, technology and capacity-building to support implementation (chapter V). Finally, this technical paper provides an overview of the possible options to enhance mitigation ambition and the next steps under ADP workstream 2 in advancing its workplan on enhancing mitigation ambition by 2015, with a particular focus on 2013 (chapter VI).

### **D. Possible action by the Ad Hoc Working Group on the Durban Platform for Enhanced Action**

28. The ADP may wish to consider this compilation of information on the mitigation benefits of actions, initiatives and options to raise ambition, in particular the options related to enhancing mitigation ambition through pledges, national actions and financial, technological and capacity-building support, and the next steps by the ADP in terms of technical work and work at the political level, with a view to considering possible action to be taken by the COP at its nineteenth session in advancing the workplan on enhancing mitigation ambition, with a particular focus on 2013 and beyond.

## **III. Existing mitigation pledges by Parties and the emissions gap**

### **A. Overview of existing mitigation pledges**

29. Many Parties to the Convention submitted conditional and unconditional emission reduction pledges until 2020 under the Cancun Agreements. For developed countries, these pledges encompass quantified economy-wide emission reductions targets under the Convention for all developed countries<sup>18</sup> and quantified emission limitation or reduction commitments under the second commitment period of the Kyoto Protocol for developed countries assuming commitments for this period.<sup>19</sup> For developing countries, these pledges

<sup>17</sup> A list of selected cooperative initiatives that is accompanied by a description and a summary of the type, coverage and participation is presented at the UNFCCC website [http://unfccc.int/meetings/bonn\\_jun\\_2013/items/7655.php](http://unfccc.int/meetings/bonn_jun_2013/items/7655.php).

<sup>18</sup> FCCC/SB/2011/INF.1/Rev.1.

<sup>19</sup> Decision 1/CMP.8, annex I.



are in the form of NAMAs.<sup>20</sup> Many Parties in their submissions elaborated on these pledges and their implementation.

30. The existing emission reduction pledges can be categorized into the following types:

(a) National quantified targets to reduce emissions: these targets state an end result and do not necessarily specify measures to achieve them, for example:

(i) Absolute emission reductions relative to a reference year; for example, to achieve a 20 per cent reduction in GHG emissions by 2020 compared with 2000;

(ii) Emission reductions relative to the ‘business as usual’ scenario; for example, to achieve a 30 per cent reduction below the ‘business as usual’ scenario emissions by 2020;

(iii) Emission reductions expressed relative to another indicator; for example, to reduce CO<sub>2</sub> emissions per unit of gross domestic product (GDP) by 30 per cent by 2020 compared with 2005;

(b) Targets expressed in non-GHG terms: these were expressed as absolute targets, for example “reduce net deforestation of primary forests to zero” or “achieve carbon neutrality”, or in relative terms, for example “reach a 15 per cent share of non-fossil fuels in primary energy consumption by 2020”;

(c) Strategies: these encompass comprehensive plans of measures and actions undertaken by governments that aim to achieve long-term mitigation objectives. They provide the overarching framework to undertake a set of mitigation measures;

(d) Programmes and policies: these encompass concrete measures undertaken by governments to achieve a specific objective that are linked to public budgets and legislative processes;

(e) Projects or portfolio of projects: these usually refer to specific investments undertaken by the private or public sectors with fixed project boundaries, clearly defined activities and a financial investment in services, infrastructure or machinery.

## B. The emissions gap

31. There is a recognition that the full implementation of the pledges made by Parties under the Cancun Agreements can bring sizeable emission reductions and that rapid progress has been made by many Parties recently in taking action and implementing policies to underpin these pledges. However, a significant emission gap remains between the expected aggregate emission reduction effect of Parties’ pledges in terms of global annual emissions by 2020 and aggregate emission pathways consistent with a likely chance of holding the increase in the global average temperature below 2 °C (the 2 °C goal) or 1.5 °C above pre-industrial levels. UNEP, in *The Emissions Gap Report 2012*, quantified the gap towards the 2 °C goal to be between 8 and 13 Gt CO<sub>2</sub> eq in 2020.<sup>21</sup> This estimate is based on the evaluation of several modelling groups that estimated the expected emissions in 2020 assuming that Parties implement their emission reduction pledges under the Convention and its Kyoto Protocol.

32. The range of the emission gap (8–13 Gt CO<sub>2</sub> eq) stems from different assumptions related to the implementation of the pledges. The gap is smaller (8 Gt CO<sub>2</sub> eq) assuming that strict accounting rules are followed and that countries implement their conditional more ambitious pledges. The gap is larger (13 Gt CO<sub>2</sub> eq) if countries implement their

<sup>20</sup> FCCC/SBI/2013/INF.12/Rev.1.

<sup>21</sup> UNEP, 2012.



unconditional pledges under lenient accounting rules. Parties recognized the urgent need to step up their mitigation action to ensure the highest possible mitigation effort and that the remaining time to close the gap by 2020 is reducing.

33. According to the UNEP *The Emissions Gap Report 2012*, mitigation potential is available to close the gap by 2020. The technical potential for reducing emissions by 2020 is estimated to be about  $17 \pm 3$  Gt CO<sub>2</sub> eq, at marginal costs below 50–100 USD/t CO<sub>2</sub> eq reduced. This would be enough to close the gap between the ‘business as usual’ scenario emissions and emissions that meet the 2 °C goal.<sup>22</sup>

34. That report also notes that the mitigation potential is diminishing as time passes, as it takes time to incentivize further emission reductions and to overcome numerous political and economic barriers to achieve the potential. In this light, the window of opportunity until 2020 is closing. Further information on mitigation potential of specific thematic areas, barriers and incentives is provided in chapter IV.

#### IV. Mitigation benefits of actions, initiatives and options to enhance ambition

35. In their submissions Parties highlighted the areas of sizeable technical mitigation potential by 2020 and emphasized the mitigation and adaptation benefits of actions, including resilience to the impacts from climate change as well as the environmental, economic and social aspects of sustainable development in the context of such action that could help Parties to build national support for stronger action.

36. Many Parties acknowledged in their submissions the barriers, such as political, economic, information and capacity-building, as a major impediment in taking further action. They also acknowledged that setting the right incentive policies and the provision of financial, technological and capacity-building support for mitigation actions could help to address these barriers and can lead to stronger action at all levels. Examples of existing national policies, including best practices and success stories, were highlighted in the Parties’ submissions. The efforts to enhance ambition are also supported through cooperative initiatives across various thematic areas.

37. A number of cooperative initiatives were also acknowledged in the submissions. These initiatives are very broad in terms of coverage of purpose (e.g. leading to political and technical dialogues or focused on implementation), participation (e.g. involving the public and private sectors, organizations and public–private partnerships, cities or local governments, etc.), geographical coverage (e.g. regional or international) and thematic coverage (e.g. energy efficiency or waste).<sup>23</sup>

38. So far, only a few preliminary estimates of the potential mitigation impact of some cooperative initiatives are available from the literature. These estimates suggest that the initiatives with the highest mitigation potential might trigger emission reductions of around 10 Gt CO<sub>2</sub> eq per year by 2020.<sup>24</sup> These initiatives could also bring benefits such as reductions in air pollutant emissions, promotion of low-emission development opportunities, stimulation of economic development based on environmentally sound solutions and the provision of additional motivation for the political engagement of various stakeholders.

<sup>22</sup> UNEP. 2012.

<sup>23</sup> Weischer and Morgen. 2012. Blok et al. 2012.

<sup>24</sup> Blok et al. 2012.



39. While the cooperative initiatives could provide value added to Parties' actions, they are not strictly additive to the emission reduction pledges under the Cancun Agreements, as the mitigation effects of the initiatives and national mitigation actions partly overlap and the total effect is smaller than the sum. However, broad participation in collective mitigation action through coalitions of governments, business, non-governmental organizations and the international community can contribute to closing the emissions gap. It was highlighted by some Parties that any cooperative initiatives that may facilitate action by developing countries should not impose on them new or additional commitments.

40. This chapter focuses on thematic areas that have been mentioned prominently in many submissions and also during the workshops organized under the ADP during the first part of its second session. The actions in these thematic areas may overlap as this is not a systematic mutually exclusive list of areas. The information for each thematic area is presented in separate sections, which first provide an overview of the mitigation potential that can be achieved; this information is mostly based on the UNEP *The Emissions Gap Report 2012*. It then describes the mitigation and other benefits that these actions could deliver. It further elaborates on the barriers to taking further action and incentives to overcoming such barriers. Incentives at the international level are covered in more depth in chapter V.

41. This chapter also provides examples of national policies, including best practices and success stories, and cooperative initiatives that are relevant for each thematic area. This list of initiatives is comprehensive but not exhaustive and reflects work in progress as there are more than a hundred such initiatives, but at the same time there is no agreed definition of what constitutes such an initiative. Preliminary assessment suggests that there are some thematic areas with an impressive number of such initiatives, for example energy efficiency, renewable energy and transport, compared with other areas, such as waste, for which there are few such initiatives.

## **A. Energy efficiency**

### **1. Mitigation potential and benefits**

42. Increasing energy efficiency is an area of significant mitigation potential. A number of Parties cited the IEA *World Energy Outlook 2012*, which states that, globally, around 2 Gt CO<sub>2</sub> eq of emissions can be reduced by 2020 through additional energy-efficiency improvements.<sup>25</sup>

### **2. Other benefits**

43. Increasing energy efficiency is often cost-effective. Upfront investment is generally more than compensated for by gains due to saved energy costs. In addition, energy efficiency enhances energy security and energy independence.

44. It is widely acknowledged that increasing energy efficiency is likely to lead to less air pollution and, therefore, results in general public health improvement. It also provides for technological advancement and may provide other benefits, such as employment and diversified energy services, reduced fuel bills of households and a reduced need for investment in the energy supply.

45. Some energy-efficiency measures can also help with adaptation to a changing climate. For example, improving building insulation to reduce energy consumption in winter can also reduce heat entering a building in the summer, thus reducing additional costs (and emissions) from air cooling.

<sup>25</sup> WEO. 2012.



### 3. Barriers and incentives

46. Increases in energy efficiency face a wide range of barriers that are broadly common in all countries. Major barriers encompass the following: (a) policy barriers, such as market organization and price distortions; (b) high project development costs relative to energy savings, high upfront capital costs and perceived capital risk and high transaction costs; (c) information barriers and lack of awareness of the financial benefits of financial institutions and of a large number of consumers to make informed consumer decisions; (d) institutional bias towards supply-side investment and energy tariffs that discourage energy-efficiency investments; (e) lack of affordable energy-efficiency technologies that are suitable to local conditions and capacity to maintain energy-efficiency investments, and (f) other legal, regulatory, institutional, financial and technological barriers.

47. More specifically, measures aimed at improving energy efficiency often require significant capital investment at the beginning of a project, and due to the perceived risks of these projects (unfamiliarity with these projects and technologies, split incentives and the large number of stakeholders involved) the cost of the capital and transaction cost are relatively high compared with conventional projects.

48. On the other hand, the significant other benefits mentioned above may be considered as incentives to undertake energy-efficiency measures. To that end the IEA *World Energy Outlook* assessed that by unlocking cost-effective energy-efficiency options, cumulative global economic output through 2035 would increase by USD 18 trillion, resulting in the greatest GDP gains in 2035 in India (3.0 per cent), China (2.1 per cent), the United States of America (1.7 per cent) and the Organisation for Economic Co-operation and Development (OECD) Europe (1.1 per cent). Additional investment of USD 11.8 trillion in efficient end-use technologies is more than offset by a USD 17.5 trillion reduction in fuel bills and a USD 5.9 trillion cut to supply-side investment.<sup>26</sup>

### 4. Examples of national policies

49. Energy-efficiency policies, such as minimum performance standards and labelling, are being successfully used by governments around the world, in particular for buildings and appliances. For example, Australia's phase-out of incandescent lamps between 2007 and 2010 is estimated to have reduced the country's GHG emissions by around 0.14 per cent. Minimum energy performance standards such as Japan's Top Runner Programme or the European Union (EU) Ecodesign Directive are estimated to have so far led to energy savings from the residential sector of 11 per cent in Japan and 16 per cent in the EU.

50. Standards and labelling programmes have also been successfully deployed in developing countries, for example in Ghana, where the implementation of minimum energy performance standards for air conditioners is expected to reduce emissions by around 2.8 Mt CO<sub>2</sub> eq over 30 years and save consumers around USD 64 million annually in energy bills.<sup>27</sup>

51. As was presented at the workshop on low-emission development opportunities, China implemented several pilot projects at the provincial and city level to test low-carbon development approaches and explore carbon market opportunities to increase the level of financing for energy-efficiency projects, among other objectives. In addition, some countries, including Denmark, France, Italy, India, the United Kingdom of Great Britain and Northern Ireland and some states in the United States, have or had in place, or plan to have systems for trading of, 'white certificates' for energy efficiency.

<sup>26</sup> WEO. 2012.

<sup>27</sup> UNEP. 2012.



## 5. Cooperative initiatives

52. Several submissions mentioned sector-specific organizations and initiatives that aim to improve energy efficiency by addressing both policy levels and concrete implementation actions and activities. For example, IEA and the International Partnership for Energy Efficiency Cooperation provide information and implementation support to improve energy efficiency to policymakers. The Secretary-General's Sustainable Energy for All initiative provides a platform for leaders from government, business, finance and civil society aimed at doubling the rate of energy efficiency gains by 2030 along with ensuring universal access to modern energy services and doubling the share of renewables in the global energy mix.

53. The Clean Energy Ministerial (CEM), which convenes economies representing over 80 per cent of global GHG emissions, was launched by the United States and has a mandate from the Major Economies Forum on Energy and Climate. The Super-efficient Equipment and Appliance Deployment initiative is a global market transformation effort for efficient equipment and appliances, and is the flagship United States led initiative under CEM.

54. The C40 Cities Climate Leadership Group on initiatives of cities and the United Nations Industrial Development Organization play an important role in implementing measures relating to energy efficiency in industry and the building sector.

55. The LEDS Global Partnership, as an organization with a dedicated working group on energy that aims to enhance coordination, information exchange and cooperation among countries and international programmes working to advance low-emission, climate-resilient growth, was highlighted in a submission. There are many other international and regional initiatives also working to increase energy efficiency.

## B. Renewable energy

### 1. Mitigation potential and benefits

56. A number of Parties cited the IEA *World Energy Outlook 2012*, which states that current policies on renewable energy can be enhanced to deliver emission reductions of around 1 Gt CO<sub>2</sub> eq by 2020, and 3 Gt CO<sub>2</sub> eq by 2030. The UNEP *The Emissions Gap Report 2012* suggests a potential of 1.5 to 2.5 Gt CO<sub>2</sub> eq from renewables only considering their possible use for electricity production of 4,000 TWh in 2020. In the longer term, by 2050, the IPCC 2011 *Special Report on Renewable Energy Sources and Climate Change Mitigation* estimates that renewable energy could help to reduce by around one third (220–560 Gt CO<sub>2</sub> eq) the projected cumulated fossil fuel CO<sub>2</sub> emissions (1,530 Gt CO<sub>2</sub>).

### 2. Other benefits

57. Similar to energy efficiency, renewable energy deployment can enhance energy security and energy independence and can also support adaptation. Increasing the share of renewable energy will lead to less air pollution and improvements in public health. It also provides technological advancement and may, as in the case of bioenergy, provide substantial benefits for rural economies in terms of employment, access to energy in the off-grid areas and diversified energy sources, which is in addition to access to modern energy services by these communities.

58. According to ILO, rapid employment growth in renewable energy, improvements in energy efficiency and enhanced access to energy can lead to major gains in employment and income opportunities, as well as significant environmental benefits. The worldwide



employment in the wind energy sector could grow from 0.7 million jobs currently to 1.9 million by 2020.<sup>28</sup>

### 3. Barriers and incentives

59. The barriers to renewable energy are similar to those of energy efficiency. Among the major barriers are policy barriers and market distortions, as well as high upfront capital costs and capital risk. Others include legal, regulatory, institutional, financial and capacity-building factors as well as those related to technology limitations, technical characteristics of available energy system infrastructure and the limited local resource potential of some renewable energy types (e.g. wind and water).

### 4. Examples of national policies

60. Almost all major economies have set themselves renewable energy targets<sup>29</sup> and a growing number of national emissions trading systems, offset mechanisms and carbon taxes have provided further incentives to promote renewable energy.<sup>30</sup>

61. A prime example of national policy stimulating an increase in renewable energy is Germany's introduction of an Electricity Feed-in Act in 1991, which regulated the purchase and price of electricity generated by hydropower, wind energy, solar energy, landfill gas, sewage gas and biomass. Together with accompanying policies, this act led to a rapid growth of electricity generation from renewable energy, rising from 3.1 per cent in 1991 to 16.9 per cent in 2009. Wind energy experienced the greatest increase, but bioenergy and solar photovoltaics systems have also grown substantially under this policy.<sup>31</sup>

62. Successful national policies for increasing renewable energy can also be tested and developed at the subnational level and then scaled up. An encouraging example is the Solar Ordinance of the city/state of São Paulo, Brazil. Integrated into the municipal building code, the ordinance required new buildings to install solar water heating systems covering at least 40 per cent of the energy used for hot water. As a result, it has stimulated market demand for an innovative renewable energy technology and resulted in significant net savings among a wide array of stakeholders and a reduction in the production costs. By 2015, it is on target to allow for a reduction of around 35,000 t CO<sub>2</sub> eq from the city's residential sector and is being currently replicated in cities across Brazil.<sup>32</sup>

63. At the project level, renewable energy projects are an integral part of the overall portfolio of support provided to developing countries and are covered by the clean development mechanism. In addition, one Party elaborated on a new mechanism for bilateral offsets as an approach to facilitate the diffusion of low-carbon technologies, including renewable energy.

64. Renewable energy is already competitive with conventional energy in some areas, for example in Denmark, depending on the price of electricity and natural resources. Also, in Spain, there are plans to install 30 GW of solar photovoltaic systems without the support of a feed-in tariff.<sup>33</sup>

<sup>28</sup> ILO. 2012.

<sup>29</sup> GLOBE International. 2013.

<sup>30</sup> See the International Carbon Action Partnership for a map of national emissions trading systems at <[http://icapcarbonaction.com/index.php?option=com\\_wrapper&view=wrapper&Itemid=147](http://icapcarbonaction.com/index.php?option=com_wrapper&view=wrapper&Itemid=147)>.

<sup>31</sup> IPCC. 2011.

<sup>32</sup> IRENA. 2012.

<sup>33</sup> Presentation of IRENA at the workshop on low-emission development opportunities held on 30 April 2013 during the first part of the second session of the ADP. Available at <[http://unfccc.int/files/bodies/awg/application/pdf/adp2\\_workshop2\\_irena\\_30042013.pdf](http://unfccc.int/files/bodies/awg/application/pdf/adp2_workshop2_irena_30042013.pdf)>.



## 5. Cooperative initiatives

65. Several submissions mentioned sector-specific organizations and initiatives that aim to increase the share of renewable energy. A prime example is the Secretary-General's Sustainable Energy for All initiative, referred to in paragraph 52 above. Importantly, the International Renewable Energy Agency (IRENA) supports countries in their transition to sustainable energy. CEM, referred to in paragraph 53 above, also plays a role in promoting renewable energy sources. There are many other international and regional initiatives also working to increase the share of renewable energy.

## C. Fossil fuel subsidy reform

### 1. Mitigation potential and benefits

66. Long-term government subsidies for fossil fuel use and also for other areas such as agriculture, are implemented to support economic development and/or for social reasons, but they may lead to market distortions.

67. Several Parties provided an estimate of 1.5 to 2 Gt CO<sub>2</sub> eq in 2020 of emission reductions from enabling fossil fuel subsidy reforms in the context of alleviating poverty and enhancing growth. The IMF estimates that raising energy prices to levels that would eliminate tax-inclusive subsidies for petroleum products, natural gas and coal could lead to emission reductions of 4.5 Gt CO<sub>2</sub> eq, representing a 13 per cent decrease in global energy-related CO<sub>2</sub> emissions.<sup>34</sup> Earlier analysis by the OECD suggested a mitigation potential of 10 per cent by 2050.<sup>35</sup>

### 2. Other benefits

68. Among the benefits of phasing out inefficient subsidies from fossil fuels are enhancing the development and diffusion of new technologies and economic growth and resilience.

69. According to the IMF, global pre-tax subsidies reached USD 480 billion (0.7 per cent of global GDP or 2 per cent of total government revenues) in 2011. The reform would offer numerous potential benefits for economic growth, for example through encouraging investment in the energy sector and increasing the longer-term competitiveness of the private sector. It could also bring substantial environmental and health benefits, such as reductions in local air pollution, traffic congestion, accidents and road damage, and can provide further incentives for investment in energy efficiency and renewable energy, and sustainable resource management.

70. The OECD research suggests that a unilateral phase-out of fossil fuel subsidies would lead to welfare gains of 0.3–4 per cent internationally and an increase of real income of 0.3–0.5 per cent in 2050 relative to the baseline.<sup>36</sup>

### 3. Barriers and incentives

71. Promoting reform aimed at phasing out inefficient subsidies from fossil fuels is a politically complex matter and views by Parties on its feasibility differ substantially. One group of Parties elaborated on the barriers for such reform, which vary between world regions owing to variations in national legislation, the stage of economic development and national policy choices and priorities.

<sup>34</sup> IMF. 2013.

<sup>35</sup> Burniaux and Chateau. 2011.

<sup>36</sup> Burniaux and Chateau. 2011.



72. According to a recent IMF assessment of energy subsidy reform, country experiences point to six main barriers: (a) lack of information regarding the magnitude and shortcomings of subsidies; (b) lack of government credibility and administrative capacity; (c) concerns regarding adverse impacts on the poor; (d) concerns regarding adverse impacts on inflation, international competitiveness and volatility of domestic energy prices; (e) opposition from specific interest groups benefiting from the status quo; and (f) weak macroeconomic conditions.<sup>37</sup>

#### 4. Examples of national policies

73. According to the IMF, examples of successful fossil fuel subsidy reforms can be found in a range of countries, including Armenia, Brazil, Chile, Kenya, Philippines, Poland, South Africa, Turkey and Uganda. Key policy elements of many of these successful reform processes include the following: (a) a comprehensive reform plan; (b) a far-reaching communications strategy, aided by improvements in transparency; (c) appropriately phased energy price increases, which can be sequenced differently across energy products; (d) improved efficiency of State-owned enterprises to reduce producer subsidies; (e) targeted mitigating measures to protect the poor; and (f) depoliticizing energy pricing to avoid the recurrence of subsidies.<sup>38</sup>

#### 5. Cooperative initiatives

74. The Group of 20 (G20) has put subsidy reforms on its agenda. Following a commitment in 2009 “to phase out over the medium term inefficient fossil fuel subsidies”, the G20 leaders have annually renewed this pledge and established a working group on energy and commodity markets to monitor and report member country progress in this area. Next steps currently under discussion include the peer review of fossil fuel subsidy reform progress, standardizing reporting and engaging with other groups making similar commitments, such as Asia-Pacific Economic Cooperation and the Friends of Fossil Fuel Subsidy Reform Group.<sup>39</sup>

### D. Reducing emissions from fluorinated greenhouse gases

#### 1. Mitigation potential and benefits

75. The UNEP *Bridging the Emissions Gap* was referred to by several Parties in relation to its estimate of a potential to reduce global emissions by 0.5 Gt CO<sub>2</sub> eq by 2020 through new actions on fluorinated gases and its estimate of additional costs of using climate-friendly alternatives when implementing the phase-out of ozone depleting substances under the Montreal Protocol of less than EUR 1/t CO<sub>2</sub> eq.<sup>40</sup> It is estimated that the amendments to the Montreal Protocol proposed by a group of countries would lead to avoiding emissions estimated at 2.2 Gt CO<sub>2</sub> eq by 2020 and 85 Gt CO<sub>2</sub> eq by 2050.<sup>41</sup>

76. According to UNEP, hydrofluorocarbon (HFC) emissions in particular, although currently representing just a small fraction of total GHG emissions, have a particularly strong global warming impact. The most commonly used HFC (tetrafluoroethane (HFC-134a)) is 1,430 times more damaging to the climate system than CO<sub>2</sub>. Emissions of HFCs are growing fast and are projected to rise to about 3.5 to 8.8 Gt CO<sub>2</sub> eq by 2050. Reduction

<sup>37</sup> IMF, 2013.

<sup>38</sup> IMF, 2013.

<sup>39</sup> G20, 2012.

<sup>40</sup> UNEP, 2011c.

<sup>41</sup> EPA, 2011.

in the release of HFCs represents considerable mitigation potential over the coming decades.<sup>42</sup>

## 2. Other benefits

77. A number of recent studies have shown that refrigeration and air-conditioning systems using low global warming potential (GWP) substances have equal or better energy efficiency than systems using high GWP HFCs and hence using such systems will help to save energy.<sup>43</sup>

78. Refrigeration and air-conditioning systems produce heat that in extreme weather events warm urban areas (thus increasing the need for further air conditioning). Increasing the efficiency of refrigeration and air-conditioning systems is vital for climate adaptation. Increased global temperatures may lead to increased demand for these systems.

## 3. Barriers and incentives

79. A number of barriers prevent changes in technology to avoid the use of high GWP HFCs. They include the need for technical developments, flammability and toxicity risks, regulations and standards that inhibit the use of alternatives, insufficient supply of components, investment costs and lack of relevant skills among technicians.<sup>44</sup>

80. Incentives and capacity-building efforts under the Montreal Protocol could help countries to make the transition. For example, the Montreal Protocol supports technology transfer to developing countries, helping industry to replace chemicals and equipment, reorganizing production processes and stimulating the redesign of products, including through funding for developing countries through the Multilateral Fund for the Implementation of the Montreal Protocol.

## 4. Examples of national policies

81. Many countries address fluorinated gases through regulations. For example, the United States' EPA plans to remove HFC-134a from the list of acceptable gases for new passenger cars and light-duty vehicles and a national programme of CO<sub>2</sub> emission reduction targets for vehicle fleets will allow credits for HFC reductions.<sup>45</sup> In the EU, commercialization of alternatives is also expected following a directive that bans the use of vehicle refrigerants with a GWP above 150 in all new vehicles from 2017.<sup>46</sup>

## 5. Cooperative initiatives

82. Proposals were made to consider the broader benefits of involving initiatives from industry as well as local authorities, intergovernmental organizations and non-governmental organizations (e.g. the International Organization for Standardization). One example of an industry-led initiative is Refrigerants, Naturally!, a global initiative led by a number of large international food and drink manufacturers to employ natural refrigerants. Another example is the Consumer Goods Forum, an international coalition of 650 retailers, manufacturers and other groups in 70 countries, which has also pledged to begin phasing out HFC refrigerants in 2015.<sup>47</sup>

<sup>42</sup> UNEP, 2011a.

<sup>43</sup> UNEP, 2011a.

<sup>44</sup> UNEP, 2011a.

<sup>45</sup> UNEP, 2011a.

<sup>46</sup> UNEP, 2011a.

<sup>47</sup> UNEP, 2011a.



83. The involvement of expert groups under the Montreal Protocol, such as the Technology and Economic Assessment Panel, technical options committees and the Scientific Assessment Panel, was encouraged by many Parties.

## **E. Reducing short-lived climate pollutants**

### **1. Mitigation potential and benefits**

84. The total impact of the aggressive reduction of short-lived climate pollutants such as black carbon, methane and HFCs has the potential to avert up to 0.5 °C of warming by 2050, as was noted in a submission.

85. UNEP estimates that fully implementing measures to reduce these three short-lived climate pollutants by 2030 could achieve reductions in the global temperature increase between 2010 and 2050 of 0.4–0.5 °C. However, UNEP acknowledges that although reductions in short-lived climate pollutants would substantially slow the rate of climate change over the coming decades, they are likely to make only a modest contribution to longer-term climate goals. For example, assuming full implementation of measures by 2020, the impact of the emission reductions achieved in that year on global temperature over a 100-year time horizon would be about 1.1 Gt CO<sub>2</sub> eq. Therefore, reduction efforts must be viewed as a strategy that complements but does not replace CO<sub>2</sub> emission reductions.<sup>48</sup>

### **2. Other benefits**

86. A number of other benefits were identified, such as improving national and local health and air quality, contributing to development priorities, and improved agriculture and ecosystems. UNEP estimates that benefits from mitigating short-lived climate pollutants by 2030 include the prevention of around 2.4 million premature deaths annually (from indoor and outdoor air pollution) and a reduction in annual crop losses of around 32 million tonnes.<sup>49</sup>

### **3. Barriers and incentives**

87. UNEP identifies many barriers to implementing measures for reducing short-lived climate pollutants across a range of sectors, including the following:

(a) In the residential sector: high fuel and technology costs; limited fuel supplies; low awareness of the health impacts of established cooking practices; limited durability of improved stoves; the high cost of technology; and lack of harmonized standards;

(b) In agriculture and forestry: weak enforcement of regulations; low stakeholder awareness; adherence to traditional practices; and the high costs of modified feed;

(c) In industrial processes: limited access to finance and skilled personnel; limited community awareness; and lack of relevant regulations and enforcement;

(d) In the fossil fuel industry: high upfront investment costs; technical constraints; lack of infrastructure, lack of nearby markets; and the cost of monitoring and maintenance;

(e) In transport: unavailability of ultra-low sulphur fuels and lack of regular inspection/enforcement;

<sup>48</sup> UNEP. 2011b.

<sup>49</sup> UNEP. 2011b.

(f) In waste management: high capital costs; low prices for methane; complex permitting schemes and liability issues; and the high cost of upgrading primary water treatment facilities.<sup>50</sup>

88. In addition, another barrier to reducing short-lived climate pollutants is the lack of reliable data, as there are no requirements for the measurement and reporting under the UNFCCC process of aerosols such as black carbon.

#### 4. Examples of national policies

89. UNEP identifies a range of national policies and practices that contribute to reducing short-lived climate pollutants. Initiatives to reduce air pollution from traditional brick kilns through a combination of health regulations and economic incentives have proved effective. For example, in Mexico, improved kiln designs boosted fuel efficiency by 50 per cent and reduced particulate pollution by 80 per cent. Policies to reduce particulate emissions from vehicles are also effective; for example from 2007 new diesel trucks for use on roads in the United States have been equipped with diesel particulate filters, a measure which is estimated to cut particulate and black carbon emissions from these diesel trucks by over 90 per cent.<sup>51</sup>

90. UNEP summarizes a range of national policy areas which could address short-lived climate pollutants. Firstly, developing national action plans for reducing short-lived climate pollutants, building on existing institutions and policies that address air quality management, development and climate change. Secondly, implementation of key actions, including strengthening national regulations in industry, transport, agriculture and waste to implement methane mitigation measures.<sup>52</sup>

#### 5. Cooperative initiatives

91. A number of Parties promote the CCAC, a fast-growing coalition of 60 partners coordinated by UNEP.

92. Additionally, UNEP notes that regional initiatives and intergovernmental networks for air pollution management have a potential to provide a basis for cooperative action as well as enhancing and supporting national action for various reasons:

(a) Regional agreements could become platforms for policy action on controlling short-lived climate pollutants, such as the Convention on Long-Range Transboundary Air Pollution and the Agreement on Transboundary Haze Pollution of the Association of Southeast Asian Nations;

(b) Intergovernmental initiatives with established structures and a focus on monitoring and scientific research could become platforms for developing scientific information, awareness-raising and capacity-building on short-lived climate pollutants, such as the Malé Declaration on Control and Prevention of Air Pollution and its Likely Transboundary Effects for South Asia, and the Acid Deposition Monitoring Network in East Asia, covering North-East and South-East Asia;

(c) Agreements or initiatives with no existing structures for pursuing knowledge or policies could become forums for awareness-raising, capacity-building, exchange of scientific information and implementation of policy action regarding short-lived climate pollutants, such as the Southern African Development Community Regional Policy

<sup>50</sup> UNEP. 2011b.

<sup>51</sup> UNEP. 2011b.

<sup>52</sup> UNEP. 2011b.



Framework on Air Pollution (known as the Lusaka Agreement) and the Intergovernmental Network on Air Pollution in Latin America and the Caribbean.<sup>53</sup>

## F. Transport

### *Transport, excluding aviation and maritime transport*

#### 1. Mitigation potential and benefits

93. According to the UNEP *The Emissions Gap Report 2012*, the mitigation potential for transport (including shipping and aviation) in 2020 compared with the ‘business as usual’ scenario is 1.7–2.5 Gt CO<sub>2</sub> eq.<sup>54</sup>

#### 2. Other benefits

94. Actions taken in transport can bring other benefits, such as reductions in local pollutant emissions, reductions in traffic congestion, safety benefits and general mobility benefits. For example, the introduction of bus rapid transit (BRT) systems has been demonstrated to improve air quality, create jobs, promote social equity and health benefits, and, through reducing vehicle traffic, reduce the number of road traffic accident fatalities.<sup>55</sup>

95. ILO estimates that substantial gains in employment can be created by a shift to mass transportation and to more energy-efficient vehicles. For example, a low-carbon transport strategy for Brazil’s cities could be a major job creator. Spending USD 42 billion on rail and waterways and USD 29 billion on high-speed rail could generate approximately 1.4 million jobs during 2010–2030. Investing USD 34 billion in BRT lanes and subway systems could yield another 3.1 million jobs, for a total employment of 4.5 million person-years over the next two decades.<sup>56</sup>

#### 3. Barriers and incentives

96. While many national and subnational policies offer significant opportunities for land transport to make a more active contribution to mitigation, administrative and financing procedures can present barriers to making such contributions.

97. UNEP notes a range of key incentives for scaling up mitigation potential in transport. For transit development, these include: identifying and assessing the co-benefits to leverage political support; implementing the highest standards from the outset to make further investment easier; improving accessibility through integrated transport systems to attract people out of private vehicles; and ensuring strong institutional support and industry engagement. For vehicle performance, this includes action in relation to standards such as: ensuring standards are technology neutral, so that markets find the most cost-effective solution; making standards increasingly stringent year on year; including all vehicle classes; being footprint-based not weight-based; improving the real world accuracy of testing procedures; and combining standards with fiscal mechanisms and scrappage schemes to accelerate the turnover of the existing fleet.<sup>57</sup>

<sup>53</sup> UNEP. 2011c.

<sup>54</sup> UNEP. 2012.

<sup>55</sup> UNEP. 2012.

<sup>56</sup> ILO. 2012.

<sup>57</sup> UNEP. 2012.

#### 4. Examples of national policies

98. There is growing evidence of the significant mitigation potential in the transport sector if three linked strategies were promoted: avoid, shift, improve. According to the UNEP *The Emissions Gap Report 2012*, examples of policies based on these strategies include the following:

(a) ‘Avoid’ policies: these policies aim to promote transit-orientated development in order to reduce travel time or frequency, thereby reducing emissions. An example of such a policy is Curitiba in Brazil, where, in the 1970s, high-density transit corridors were integrated into the city’s master plan;

(b) ‘Shift’ policies: these policies promote shifts to the low-emission modes of transportation and improve the quality of public transport. An example of such a policy is the introduction of BRT in Mexico City, where 10 per cent of BRT riders have shifted from private cars;

(c) ‘Improve’ policies: these are policies aimed at improving the energy efficiency of vehicles and incentive policies. An example of such a policy is a vehicle performance standard for new light-duty vehicles, which is being implemented in Australia, Canada, China, the EU, Japan, the Republic of Korea and the United States. These standards are expected to reduce the fuel consumption and GHG emissions of the new light-duty fleet in these countries by over 50 per cent from 2000 by 2025.

#### 5. Cooperative initiatives

99. A range of initiatives exist to address transport-related emissions; for example, the Global Fuel Economy Initiative, which is a partnership of six organizations that promotes research, discussion and action to improve fuel economy, and the UNEP Partnership for Clean Fuels and Vehicles, which promotes cleaner fuels and vehicles, particularly in developing countries and countries with economies in transition. A number of other initiatives focus on transport-specific interventions, while many more deal with transport along with other thematic areas.

##### *Aviation and maritime transport*

#### 1. Mitigation potential and benefits

100. A group of Parties and observers referred to the reduction levels for aviation and maritime transport contained in the *Bridging the Emissions Gap* report. Both thematic areas combined have a mitigation potential of about 0.3–0.5 Gt CO<sub>2</sub> eq in 2020.

#### 2. Other benefits

101. One group of Parties listed some of the benefits of emission reduction measures within the maritime and aviation sectors. Additional to the environmental, technological and health benefits of reduced GHG emissions, they cited the development and diffusion of new technologies and air quality improvement.

102. Alternative fuels for the aviation sector could have promising job creation benefits. According to ILO, the Government of India projects that up to 5 million jobs could be created through village-based biofuel production, and another 5 million from full-scale industrial biofuels (although it is unlikely that this will be driven by demand solely from the aviation sector).<sup>58</sup>

<sup>58</sup> ILO. 2012.



### 3. Barriers and incentives

103. Improving fuel efficiencies represent both mitigation potential and an incentive for operational cost savings. However, measures to deliver such efficiencies face a number of barriers in both the aviation sector and the shipping sector. For example, according to UNEP, improving air traffic management can potentially facilitate reduced aviation fuel burn, but increasing airport traffic volumes make it harder to optimize operations to achieve this. While current technologies could improve the fuel efficiency of new aircraft and shipping engines, they could also force trade-offs between reduced emissions of CO<sub>2</sub> versus increased emissions of nitrogen oxides. Additionally, while biofuels may offer a low-carbon alternative to aviation kerosene, associated indirect emissions (e.g. from land-use change) may even lead to an overall increase.<sup>59</sup>

### 4. Examples of national (and international) policies

104. Owing to the transboundary nature of shipping and aviation, the examples of international policies are included here. Broadly, policies to reduce emissions from shipping and aviation fall into three main categories: operational, technical and market-based instruments.<sup>60</sup>

105. In the aviation sector:

(a) Operational policies: there are two major initiatives to improve air traffic management: the Single European Sky Air Traffic Management Research programme, which aims to achieve a 10 per cent reduction in emissions per flight by 2020, and the Next Generation Air Transportation System of the United States, which aims to save an average of 1.6 Mt CO<sub>2</sub> per year to 2018, or 0.7 per cent of the annual total aviation emissions of the United States;

(b) Technical policies: the International Civil Aviation Organization (ICAO) Committee on Aviation Environmental Protection is currently developing a CO<sub>2</sub> emissions standard for aircraft;

(c) Market-based instruments: two types of market-based instruments attach a price to emissions: (i) charges such as taxes/levies; and (ii) cap-and-trade instruments such as tradable emissions rights/allowances/permits/offsets. In the aviation sector, cap-and-trade schemes are currently being implemented at both the national and international level. These include domestic flights in the New Zealand emissions trading scheme (ETS) and both domestic and international flights in the EU ETS, although the regulation on international flights is currently temporarily suspended.

106. In the shipping sector:

(a) Operational policies: the International Maritime Organization (IMO) has mandated ships to carry a Ship Energy Efficiency Management Plan from July 2012. It provides operators with a framework for the planning, implementation, monitoring and self-evaluation/improvement of operational measures appropriate to the ship, but will also assist in identifying possible technical improvements;

(b) Technical policies: IMO introduced a mandatory CO<sub>2</sub> standard in 2011, known as the energy-efficiency design index, for major classes of new ship built from 2013, representing 72 per cent of emissions from new ships;

<sup>59</sup> UNEP. 2011.

<sup>60</sup> UNEP. 2011.

(c) Market-based instruments have been discussed within IMO; they can be classified into three groups: (i) levy-type proposals; (ii) cap-and-trade proposals; and (iii) a baseline-and-credit trading scheme, setting a fleet average fuel efficiency target.

## 5. Cooperative initiatives

107. Although not cooperative initiatives in the same form as many of the initiatives referred to in this technical paper, several Parties and observers referred to the work of IMO and ICAO.

108. The aviation industry trade association – the International Air Transport Association – has made voluntary commitments to CO<sub>2</sub> emission reduction efforts. It aims to improve fuel efficiency by 1.5 per cent per year by 2020, achieve ‘carbon-neutral growth’ from 2020 and reduce CO<sub>2</sub> emissions by 50 per cent, relative to 2005, by 2050.<sup>61</sup>

## G. Land use

109. Agriculture, forestry and other land use covers a wide range of activities, including forestry, carbon sequestration in agricultural soils and non-CO<sub>2</sub> emissions from agricultural production. Some Parties provided additional information on national actions in this thematic area at the workshop on opportunities for mitigation and adaptation related to land use held on 1 May 2013 at the first part of the second session of the ADP.<sup>62</sup>

### 1. Mitigation potential and benefits

110. According to the UNEP *The Emissions Gap Report 2012*, the forestry sector has the potential to reduce emissions by between 1.3 to 4.2 Gt CO<sub>2</sub> eq by 2020, while mitigation potential from agriculture is reported to range from 1.1 to 4.3 Gt CO<sub>2</sub> eq.<sup>63</sup>

111. Specifically on REDD-plus, the potential to reduce net global emissions by 2030 is estimated around up to 3 Gt CO<sub>2</sub> eq annually, as was noted by some Parties. It was also acknowledged that further work to identify cost-effective REDD-plus mitigation potential is essential.

### 2. Other benefits

112. Several Parties referred to benefits from REDD-plus beyond reducing GHG emissions, including strengthening sustainable forest management, providing financial revenues and enhancing the participation of stakeholders. In a number of countries, the legislation on reducing deforestation recognizes the benefits of protecting natural forests, such as water management, soil erosion and storm protection.<sup>64</sup> Sustainable forest management provides both essential environmental services and renewable raw material to other sectors, while also providing jobs. An annual investment of USD 30 billion into reduced deforestation and degradation of forests could sustain up to 8 million additional full-time workers in developing countries.<sup>65</sup>

113. Reducing deforestation via REDD-plus could also have significant local adaptation benefits. For example, trees and densely vegetated areas bind soils, prevent leaching of vital nutrients and in some cases can contribute to watershed protection, reduce the risk of extreme flooding and reduce the amount by which a locality will overheat.

<sup>61</sup> UNEP. 2011.

<sup>62</sup> <[http://unfccc.int/meetings/bonn\\_apr\\_2013/workshop/7490.php](http://unfccc.int/meetings/bonn_apr_2013/workshop/7490.php)>.

<sup>63</sup> UNEP. 2012.

<sup>64</sup> GLOBE International. 2013.

<sup>65</sup> ILO. 2012.



### 3. Barriers and incentives

114. A number of Parties elaborated on barriers to further implementing REDD-plus activities, citing the following: (a) an incomplete methodological guidance package (e.g. reference levels, national forest monitoring systems, and monitoring, reporting and verification); (b) poor data on forest inventories and estimated CO<sub>2</sub> emissions and removals; (c) drivers of deforestation (e.g. private-sector activities and international markets); (d) poor institutional framework (e.g. national forest governance and soil legislation, land-use policy, land tenure structure); and (e) lack of sufficient financial resources.

115. Limited access to financial resources and lack of long-term international funding were mentioned as key barriers for developing countries. Constrained access to low-cost effective technologies and limited capacity on the ground often prevent successful scaling up of pilot activities and best practices.

### 4. Examples of national policies

116. Policies for reducing emissions from deforestation fall into three broad categories – protected areas; command and control measures; and economic instruments:<sup>66</sup>

(a) Protected areas: the expansion of protected areas in Brazil has significantly decreased both fire incidence and deforestation in the Amazon. In Costa Rica, protected areas now generate more income from ecotourism than did livestock exports;

(b) Command and control measures: in the Brazilian Amazon, improved satellite-based monitoring has enabled field-based law enforcement to respond to deforestation in real time. Modernizing the federal environment police (Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais Renováveis) and implementing innovative enforcement measures, such as confiscation of illegally used assets (e.g. cattle, timber and machinery), area-based trade embargos and making slaughterhouses and supermarkets liable for offences by suppliers involved in illegal deforestation, has also contributed significantly to reducing deforestation;

(c) Economic instruments: in Costa Rica, applying forest conservation and reforestation incentives to private farms, including direct subsidies for farm-level forest conservation and payments for ecosystem services (e.g. protection of watersheds, carbon stocks, biodiversity and natural beauty), have all played a significant role in reducing deforestation. As was presented at the workshop on mitigation and adaptation opportunities related to land use, Indonesia established the climate change trust fund to coordinate and pool financial resources coming from the private sector and donor organizations to finance mitigation and adaptation policies in land use and other areas.

117. A number of countries (e.g. Bangladesh, Brazil, Indonesia, Mexico, Nepal and Viet Nam) have significant laws and regulations designed to reduce deforestation. As a result, for example, Brazil has managed to reduce its emissions from deforestation by almost 80 per cent over five years, cumulatively avoiding emissions of nearly 1 billion tonnes of CO<sub>2</sub>. The United Republic of Tanzania presented at the workshop on mitigation and adaptation opportunities related to land use the law that it introduced in 2002 on participatory forest management, which provides a legal basis for communities to own and manage forests. At the moment, about 10 per cent of forests are managed by local communities in Tanzania.

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<sup>66</sup> UNEP. 2012.

## 5. Cooperative initiatives

118. One Party mentioned the Forest Carbon Partnership Facility as an important facility that has enabled pilot programmes in developing countries. Another Party highlighted its support for the work of the Global Research Alliance on Agricultural Greenhouse Gases and the REDD-plus Partnership.

119. The UN-REDD Programme was reiterated in a number of submissions. Further initiatives include the Global Bioenergy Partnership and the Global Partnership on Forest and Landscape Restoration.

## H. Waste

### 1. Mitigation potential and benefits

120. According to the UNEP *The Emissions Gap Report 2012*, the mitigation potential derived for the waste sector is around 0.8 Gt CO<sub>2</sub> eq.<sup>67</sup>

### 2. Other benefits

121. In addition to the mitigation benefits, implementing effective waste management systems brings a wide range of environmental, social and economic benefits, including improved public health, environmental protection and other sustainable development benefits.

122. Composting organic wastes in cities and transporting them to agricultural land brings multiple benefits in closing the nutrient cycle by returning the nutrients that are exported from the farm, avoiding methane emissions and increasing the rate of soil carbon sequestration.

### 3. Barriers and incentives

123. To tap the full potential for emission reductions in the waste sector, the following barriers and incentives were identified in the submissions:

(a) Lack of sustainable financing mechanisms, as well as adequate regulatory frameworks and institutional arrangements;

(b) Insufficient capability to identify the environmental and social benefits of actions. For example, transparent identification of key players and their respective interests and operational limitations is critical for waste prevention;

(c) Action to transfer sustainable technology in the waste sector to developing countries is crucial.

### 4. Examples of national policies

124. Since 1990, the EU has reduced its emissions in the waste sector by 31 per cent, mainly via reduced methane emissions from landfills as the result of regulating waste through the entire life cycle. In many of the megacities of the developing world (i.e. São Paulo, Dhaka, Buenos Aires, Bogota and Rio de Janeiro) landfilling and composting are already producing huge GHG emission reductions and contributing to energy generation or to soil recovery processes.

<sup>67</sup> UNEP. 2012.



## **5. Cooperative initiatives**

125. The Global Methane Initiative is the only international initiative to specifically target methane abatement, recovery and use by focusing on the five main methane emission sources: agriculture, coal mines, municipal solid waste, oil and gas systems, and wastewater.

# **V. Finance, technology and capacity-building to support implementation**

126. As noted in many submissions, successful implementation of national actions by developing countries is linked to access to financial, technological and capacity-building support. For many developing countries, enhanced delivery of support will be a major incentive for the implementation of their pledges and may help these countries to identify and explore further options to reduce emissions. This chapter presents an overview of options to enhance the delivery of finance, technology and capacity-building to support the implementation of mitigation actions at the national level.

## **A. Finance**

127. Various options and approaches have been proposed by many Parties in their submissions to enhance the delivery of the financial means of implementation. This includes ensuring and increasing the transparency of financial support made available and of financial support delivered. This also includes enhancing the support to Parties to identify financial sources, mobilize further financial support and attract financial support. Finally, improving institutional arrangements and operationalization and capitalization of the institutions under the Convention, such as the Green Climate Fund, the Adaptation Fund and the NAMA registry, was acknowledged by a number of Parties.

### **1. Transparency of financial support**

128. Several Parties called for more clarity on the support made available, especially with regard to reaching the goal of mobilizing USD 100 billion per year by 2020 as pledged by developed country Parties. Preparation by developed countries of a road map for financial support and ways to increase it was seen as a way to support enhanced mitigation and adaptation actions by developing countries and to achieve the above-mentioned goal. Developed countries could possibly commit climate financing flows through the financial mechanism of the Convention for both the medium term (2013–2020) and the long term (post-2020) on the basis of the implementation of Article 4, paragraphs 3, 4, 5, 7 and 8, of the Convention.

129. In the context of the transparency and clarity of funding priorities and distribution modalities, one Party noted the need to operationalize arrangements for finance under the Convention, especially for the funding of the Green Climate Fund and the Adaptation Committee. Such transparency and clarity of financial support is deemed critical to the implementation of NAMAs and could be enhanced through indication in the NAMA registry of the amount of support available for NAMAs. Another Party suggested that near-term financial support for mitigation could focus on actions that advance near-term ambition and assist countries that have demonstrated a willingness to take action and to improve their enabling environments.

130. The importance of the monitoring, reporting and verification of financial support was acknowledged in order to: (a) ensure accurate accounting of the provision of funds

from developed country Parties to developing country Parties; (b) assess compliance with financial obligations for mitigation, adaptation, transfer of technology and capacity-building; and (c) ensure robustness and transparency of the financial mechanism of the Convention.

## **2. Support to Parties to identify financial sources and attract financial support**

131. Some Parties suggested that more work should be undertaken by the bodies under the Convention, in particular to identify financial sources of support, including for REDD-plus. To that end, some Parties recalled their engagement in the COP work programme on long-term finance and its aim to inform developed country Parties in their efforts to identify pathways for mobilizing the scaling up of climate finance to USD 100 billion per year by 2020 from public, private and alternative sources. In this context, the EU recalled its voluntary contribution of EUR 5.5 billion of climate finance for the coming years.

132. Many Parties proposed that specific innovative sources of financial support be examined, such as the Daly-Correa tax, financial transaction taxes, the net avoided emissions mechanism and the use of IMF special drawing rights, the removal of fossil fuel subsidies, and the ETS and Adaptation Fund levies. These sources could contribute to increasing the ambition of support by developed countries.

133. Some Parties invited developing country Parties to make complementary efforts to strengthen their enabling environment to attract support, including private investment. Such efforts could focus on contract enforcement, protection of IPRs, macroeconomic and political stability, availability of local currency financing, the existence of regulatory requirements and/or incentives or the removal of disincentives to motivate investment.

134. Another approach suggested is to encourage developing country Parties to prepare clear budgetary provisions for each NAMA submitted to the registry.

135. Developed country Parties are invited to use public finance to leverage and incentivize additional private-sector investment and to support actions in developing countries that cannot attract private-sector investment. According to an observer, the Green Climate Fund can also play a role by supporting initiatives that reduce costs and eliminate barriers and perceived risks, in order to make low- or zero-carbon technologies more competitive.

136. On support in some specific thematic areas, for example transport, a proposal was made to link the voluntary commitment of multilateral development banks made at the Rio+20 conference to additional climate change finance, for example from the Green Climate Fund.

## **3. Institutional arrangements under the UNFCCC process**

137. Some of the options to enhance the financial means of implementation refer to existing institutional arrangements under the UNFCCC process, including the extended work programme on long-term finance, the NAMA registry and the Green Climate Fund. New and non-UNFCCC process related institutional arrangements are also suggested to enhance the financial means of implementation as described below.

138. Many Parties and observer organizations expect the extended work programme on long-term finance to prepare recommendations to the COP at its nineteenth session in order to scale up climate finance flows towards the 2020 target and meet the needs of developing countries to realize proposed pledges and NAMAs and further increase their levels of ambition.



139. For many Parties, the Green Climate Fund and the Technology Mechanism should be provided with financial resources in order to ensure their effectiveness and to incentivize actions from developing countries.

140. The Green Climate Fund is deemed important in promoting a paradigm shift in developing countries on the basis of country-owned strategies, plans and programmes that are developed and implemented through participatory and inclusive processes and that are integrated into developing countries' core development plans. To that end, guidance by the COP to the Green Climate Fund is needed on the policies, programme priorities and eligibility criteria that would be most effective in catalysing the necessary paradigm shift.

141. Developed countries were encouraged to indicate in the NAMA registry the amount of support that they intend to mobilize for NAMAs and developing countries to indicate clear budgetary provisions for the NAMAs they submit to the registry.

142. New institutional arrangements are proposed to facilitate action on finance under the UNFCCC process and beyond it. For the reporting of climate finance provided, one Party proposed the establishment of a financial support registry, which will be open and transparent and accessible to all Parties, and the use of a common, internationally agreed format, approved by the COP. It was suggested to establish a working group or framework by the ADP that would include international financial institutions, bilateral donors and partner countries, to develop and assess the costs of NAMAs. Also, the importance of the regional development banks was acknowledged within the overall financial architecture on climate change.

## **B. Technology**

143. Many Parties highlighted the need to provide technological support to developing countries, including facilitating access to new technologies, while one Party emphasized the specific assistance needs of countries with economies in transition. Technological support is required for both adaptation and mitigation actions, including NAMAs. According to many Parties, the technology needs assessment and technology road maps could be instrumental in facilitating technology development and transfer in developing countries.

144. The diffusion of environmentally sound technologies in developing countries is of paramount importance in increasing pre-2020 ambition to narrow the emissions gap, as demonstrated by the experience in cost reduction of renewable energy technology as was noted by an observer organization. Another example is the success of the work under the Montreal Protocol, which supports technology transfer to developing countries by helping industry to replace chemicals and equipment, reorganize production processes and stimulate the redesign of products.

145. Various options and approaches have been proposed to enhance the delivery of the technological means of implementation. This includes solving the issues that relate to strengthening the Technology Mechanism and IPRs.

### **1. Technology Mechanism**

146. For many Parties, the Green Climate Fund and the Technology Mechanism should be fully capitalized in order to ensure their effectiveness and to incentivize actions by developing countries.

147. Some Parties and observers share the view that the Technology Mechanism must be strengthened to enable and incentivize enhanced actions in developing countries. According to an observer, the Technology Mechanism should be tasked to set a plan to determine how technology can address the 2 °C goal, adopt criteria to help to guide Parties in evaluating

the environmental soundness of technologies, facilitate innovation of key environmentally sound technologies and optimize the integration of these actions with the NAMA process. Specific suggestions were also made for the Technology Executive Committee in the areas of technology needs mapping, strategic technology planning, and coordination of technology research, development and diffusion.

148. Several Parties suggested developing facilitative mechanisms and approaches under the Technology Mechanism in order to scale up the transfer of environmentally sound technologies to developing countries and address barriers to such transfers, including cost and policy barriers. This will ensure that such transfers support the objective of eventually developing endogenous capacity in developing countries to produce their own environmentally sound technologies as envisioned under Article 4, paragraph 5, of the Convention.

## **2. Intellectual property rights**

149. According to some Parties, IPRs and the costs associated with accessing technology are considered the main barriers for developing countries to move towards a lower emissions pathway, including the implementation of NAMAs, as well as to take effective adaptation actions. Addressing key barriers to technology transfer such as IPRs is viewed by these Parties as critical to enabling enhanced actions in developing countries.

150. In this context, a view was expressed that a facilitative IPR regime that balances rewards for innovators with the common good of humankind will help to advance mitigation and adaptation actions at the scale and speed warranted by the Convention.

151. Important in addressing IPRs is the ongoing work by the Technology Executive Committee on the barriers to technology development and transfer and its key message conveyed to the subsidiary bodies during COP 18 that “intellectual property rights were identified as an area for which more clarity would be needed on their role in the development and transfer of climate technologies based upon evidence on a case by case basis.” COP 18, by decision 13/CP.18, noted the key messages of the Committee, in particular on enabling environments for, and barriers to, technology development and transfer and that further work on these issues is being undertaken by the Committee.

## **C. Capacity-building**

152. Many Parties and observers stress the importance of achieving further progress on capacity-building in the context of the ADP’s work in order to provide means to enable the implementation of actions in developing countries, in particular to support NAMAs, REDD-plus and the development and transfer of technologies.

153. Facilitating an enabling environment in developing countries to enhance mitigation and adaptation actions was seen as one of the key objectives of capacity-building. This includes strengthening of national institutional governance and national capacities to develop environmentally friendly technologies to measure efforts and emission reductions and to adapt to the adverse effects of climate change. The roles of cooperative initiatives become important in this regard, for example the LEDS Global Partnership (see para. 55 above). A suggestion was made to use lessons learned from the work under the Montreal Protocol to overcome the challenge of insufficient domestic capacity to design and implement the range of programmes and policies (see para. 80 above).



## **VI. Options to enhance mitigation ambition and the next steps under workstream 2 in advancing its workplan on enhancing mitigation ambition**

154. In line with the mandate for the submissions, Parties made suggestions on the way forward by the ADP in making concrete steps to advance the workplan on enhancing mitigation ambition. These are covered in chapter VI. A. below.

155. In particular, Parties identified a number of options under ADP workstream 2 in relation to both enhancing the ambition of emission reduction pledges under the Cancun Agreements, and enhancing the ambition of mitigation actions and of financial, technological and capacity-building support for implementation. These options are presented in chapters VI.B and VI.C.

156. In terms of the organization of work under ADP workstream 2, on mitigation ambition, the options proposed by Parties could be broadly considered as options for technical work and options for work at the political level. Technical work by the ADP was deemed essential to build momentum towards action to be taken at the political level. These are reflected in chapters VI.D and VI.E.

### **A. Cross-cutting issues and next steps under workstream 2 in advancing its workplan on enhancing mitigation ambition**

157. The cross-cutting issues relating to enhancing the ambition of pledges, and the ambition of mitigation actions and of financial, technological and capacity-building support are relevant to all options that are discussed below.

158. Several Parties expressed the view that Parties should be guided by the objective and principles of the Convention, in particular the principles of equity and common but differentiated responsibilities and respective capabilities, and that developed countries should take the lead in terms of their existing commitments by 2020 in relation to emission reductions as well as the provision of financial, technological and capacity-building support. It was stated in some submissions that the question of ambition between 2012 and 2020 under the ADP relates only to commitments by Parties included in Annex I to the Convention (Annex I Parties). A suggestion was made to launch a review of the adequacy of the mitigation commitments by Annex I Parties in accordance with Article 4, paragraph 2(d), of the Convention.

159. In this context, the following steps were proposed by some Parties for consideration by the ADP:

(a) Clarification of pledges: As an essential step forward to enhancing the pledges and their implementation, Parties called for the continuation of the process of clarification of their pledges to enable an analysis of pledges and associated conditions, including emissions pathways in accordance with the 'business as usual' scenario. This could be based on information to be submitted by Parties on the implementation of mitigation actions and economy-wide emission reduction targets by 2020 under the Convention and of commitments to reduce emissions under the Kyoto Protocol. As part of the clarification process, information on Parties' individual pledges and related efforts could be published on the UNFCCC website to make it more clearly visible to the public;

(b) Recognition of efforts: As a next step, Parties' efforts and actions to implement mitigation pledges could be recognized by Parties under the Convention through sharing information on best practices, success stories and examples of leadership on

specific topics and specific mitigation actions undertaken, including information on the mitigation potential of these actions;

(c) **Assessment:** Once clarified and recognized, the pledges and actions by each Party could be assessed under the monitoring, reporting and verification system under the Convention in terms of assessment of emission levels and progress towards mitigation pledges, evaluation of implementation progress and identification of additional mitigation opportunities, barriers and suggestions on the ways to enhance ambition. This would include a forward-looking evaluation as well as information on the monitoring of implementation. The ADP could invite Parties to consider how they can increase ambition or organize a detailed analysis of pledges and suggestions per country to raise ambition.

## **B. Options to enhance the ambition of emission reduction pledges**

160. In their submissions, many Parties elaborated on several options and ways to enhance the ambition level of the pledges, including the following:

(a) **Addressing conditions associated with a number of pledges:** this is an option whereby the Parties address such conditions with a view to moving to the higher end of the range of their pledges or at least reassess the conditions associated with their pledges. This could potentially reduce the emission gap by about 2 Gt CO<sub>2</sub> eq per year according to the UNEP *The Emissions Gap Report 2012*. Pledges have different conditions associated with them, including requirements of action by other Parties and the provision of finance, technology and capacity-building support as well as clarification of support needs;

(b) **Broadening the scope of existing pledges:** Parties could include additional sectors if not already included in the initial pledge. This option applies only to several Parties that have specifically excluded a sector or a gas from the pledge;<sup>68</sup>

(c) **Adherence to strict accounting rules:** Parties could also adhere to strict accounting rules for the fulfilment of the pledges. This would include limited use of credits from land use, land-use change and forestry and of surplus allowances from earlier commitment periods and the avoidance of double counting of offsets. The potential to narrow the gap with this option is around 3 Gt CO<sub>2</sub> eq per year;<sup>69</sup>

(d) **Increasing the number of countries that make pledges:** Parties that have not yet made formal pledges could be invited to do so; this invitation should recognize the need to provide flexibility for the least developed countries, small island developing States and African countries. Countries that have not made a pledge account for roughly 7 Gt CO<sub>2</sub> eq according to the UNEP *The Emissions Gap Report 2012*. Their contribution to emission reductions could be of the order of 1 Gt CO<sub>2</sub> eq per year, under the hypothetical assumption that they would reduce their emissions by 15 per cent below the baseline by 2020;

(e) **Making new and more ambitious pledges:** Parties should propose new pledges that go beyond the existing pledges; for example, when Parties with commitments for the second commitment period of the Kyoto Protocol revisit, in accordance with decision 1/CMP.8, their quantified emission limitation and reduction commitments for that period at the latest by 2014;

(f) **Immediate ratification of the amendment to the Kyoto Protocol:** some Parties called, as a matter of urgency, for immediate ratification during 2013 of the amendment to the Kyoto Protocol for the second commitment period and for commitment by the non-Kyoto Protocol Annex I Parties to comparable enhanced mitigation ambition.

<sup>68</sup> Fransen and Hatch. 2011.

<sup>69</sup> UNEP. 2012.



### **C. Options to enhance the ambition of mitigation actions and the ambition of financial, technological and capacity-building support**

161. Many Parties took action at all levels, including launching analytical work, self-assessment and stakeholders consultations in relation to their pledges, making relevant institutional, political and legal arrangements, and enacting policies and measures to implement these pledges. Possible actions by the ADP were suggested by many Parties to enhance the implementation of mitigation action and related financial, technological and capacity-building support that include the following:

(a) Undertaking analysis and identification of best practices for national actions to reduce emissions: the ADP could set up a process of regular analysis of mitigation actions by Parties, their effects and benefits in order to distil lessons learned and best practices. It could explore and compile concrete policies and measures/best practices through discussion of success stories and examples of leadership. For example, this could be done in conjunction with the international assessment and review and international consultation and analysis processes that will be launched in 2014. Countries could be inspired by the actions others are taking;

(b) Recognition of cooperative initiatives and their role in catalysing action towards increasing ambition: it was suggested that the ADP could provide ways to recognize actions by cooperative initiatives, for example through the UNFCCC website or documents prepared by the secretariat. In addition, there could be consideration of the effect of actions by cooperative initiatives and their contribution to supporting and enhancing national action. This could include action in the context of cooperation with relevant international organizations, such as the Montreal Protocol. This could also include encouraging non-Party actors to provide information to reflect their pledges, initiatives and efforts. This would allow their efforts to receive formal recognition in the UNFCCC process. Several Parties cautioned that any international or regional initiatives shall not introduce any new or additional commitments for developing countries;

(c) Assessing ways to provide enhanced financial, technological and capacity-building support to developing countries for implementation of their pledges: the ADP could call on Parties and the secretariat to accelerate the operationalization of the NAMA registry as a tool to facilitate matching possible support to proposed mitigation activities. The benefits for receiving countries would be the availability of funds, and for donor countries the transparent information on the demand. The ADP could also consider further options with regards to financial, technological and capacity building support that are presented in Chapter V.

### **D. Options for technical work to enhance mitigation ambition**

162. Many Parties and observers proposed various ways for the ADP to advance its work to enhance mitigation ambition. Many proposed technical work to better understand actions, initiatives and options, their expected mitigation potential and impact, and their contribution to closing the emission gap, covering in a comprehensive manner mitigation, adaptation and finance and technological support. It was also proposed by many Parties that the ADP provide a forum for further work at the political level, to send a political signal to increase ambition. Altogether, this work by the ADP would aim to translate technical considerations into concrete action and build a strategy with milestones up to 2020.

163. The technical work would aim at getting a better understanding of actions, initiatives and options, their expected mitigation potential, their contribution to closing the emission gap as well as the role of the UNFCCC and other stakeholders facilitating further mitigation

actions. A group of Parties called for a technical working group lead by the champions representing developed and developing country Parties to identify viable solutions and actions to be taken at the COP in Warsaw, Poland.

164. Most of this work could be done through technical expert meetings, such as dialogues and workshops in 2013, that could be used to build Parties' understanding on the options and ways to enhance mitigation ambition and to build mitigation toolboxes. The topics that were proposed by many Parties could be summarized as follows:

- (a) Mitigation potentials, national policies and implementation plans, their benefits and readiness for mitigation action in the key thematic areas;
- (b) Specific best practices and cost-effective mitigation actions and policies, including NAMAs, as well as strategies for overcoming any implementation barriers;
- (c) Ways to enhance financial, technological and capacity-building support;
- (d) Opportunities, benefits and barriers for Parties working together through cooperative initiatives to scale up efforts;
- (e) The potential role for the UNFCCC to facilitate and encourage additional mitigation action, e.g. by helping to lift barriers, creating improved conditions for further mitigation action and providing transparency and recognition of efforts;
- (f) The role of stakeholders, such as non-governmental organizations, academia and the private sector, to realize further the cost-effective mitigation potential and the associated co-benefits of sustainable development.

165. A number of Parties proposed calling for submissions by Parties and observer organizations on information on their actions and initiatives, with a focus on energy efficiency and renewable energy as an input for technical papers by the secretariat on these matters. There was also a call for the preparation of an information document by the secretariat on international organizations and cooperative initiatives as a way for a formal recognition under the UNFCCC of the efforts as well as a technical paper on the mitigation potential of REDD-plus.

166. Regarding linkages with the subsidiary bodies under the UNFCCC, a number of Parties suggested requesting the subsidiary bodies to provide inputs to the ADP, in particular on the work programmes on the clarification of pledges. There was also a suggestion for the ADP to take into account the 2013–2015 review when establishing overall mitigation ambition. There was a further suggestion to consider the results of the IPCC Fifth Assessment Report.

## **E. Options for work at the political level to enhance mitigation ambition**

167. The work at the political level is deemed important for sending a political signal to all Parties to increase ambition by 2020. Many Parties sought to involve ministers through a clear plan for ministerial involvement in 2013 and 2014, to be agreed by the ADP, with a focus on preparing inputs for the high-level meeting proposed by the Secretary-General, referred to as the Summit of Leaders, which could help to build a momentum for further action on ambition and for completion of negotiation of the 2015 agreement.

168. In addition, it was proposed to gradually bring more structure into the programme of work by the ADP to underscore the political commitment by Parties to deliver a new legally binding agreement by 2015. Accordingly, a number of Parties suggested that the work at the political level should start in 2013, at COP 19, and continue in 2014. More specifically, some Parties proposed that a ministerial meeting on ambition in 2013, focusing



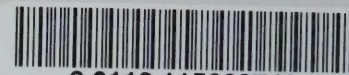
on energy efficiency and renewable energy, that could guide consideration on options and ways to increase global ambition be convened at COP 19 to form a basis for a decision to be taken by the COP on that matter. A high-level round table on ambition and a ministerial meeting with a focus on financial support to developing countries in 2013 could guide consideration of options and ways to increase global ambition.

169. There was a proposal for COP 19 to invite the Montreal Protocol to undertake a global phasedown of the production and consumption of HFCs, while recognizing that emissions of these substances will continue to be covered by the UNFCCC. Another proposal was that COP 19 and COP 20 provide a platform to encourage non-Party actors to announce major new efforts that address climate change. This would allow governors, mayors, businesses and others to speak about their efforts in a high-profile setting.

## References

- Blok K, Höhne N, van der Leun K and Harrison N. 2012. Bridging the greenhouse-gas emissions gap. *Nature Climate Change*. 2: pp.471–474. Available at <<http://www.nature.com/nclimate/journal/v2/n7/full/nclimate1602.html>>.
- Burniaux J and Chateau J. 2011. *Mitigation Potential of Removing Fossil Fuel Subsidies: A General Equilibrium Assessment*. OECD Economics Department Working Papers, No. 853. Available at <[http://www.oecd-ilibrary.org/economics/mitigation-potential-of-removing-fossil-fuel-subsidies\\_5kgdx1jr2plp-en](http://www.oecd-ilibrary.org/economics/mitigation-potential-of-removing-fossil-fuel-subsidies_5kgdx1jr2plp-en)>.
- EPA. 2011. *Benefits of Addressing HFCs under the Montreal Protocol*. Stratospheric Protection Division, Office of Atmospheric Programs, Office of Air and Radiation. Available at <<http://www.epa.gov/ozone/downloads/Benefits%20of%20Addressing%20HFCs%20Under%20the%20Montreal%20Protocol,%20June%202012.pdf>>.
- Fransen T and Hatch J. 2011. *GHG-Framed Mitigation Actions by Developing Countries*. World Resources Institute. Available at <[http://pdf.wri.org/working\\_papers/ghg\\_framed\\_mitigation\\_actions\\_by\\_developing\\_countries.pdf](http://pdf.wri.org/working_papers/ghg_framed_mitigation_actions_by_developing_countries.pdf)>.
- G20. 2012. *Summary of Progress Reports to G-20 Leaders on the Commitment to Rationalize and Phase Out Inefficient Fossil Fuel Subsidies*. Available at <[http://www.g20mexico.org/images/stories/canalfinan/deliverables/energy\\_markets/Fossil\\_Fuel\\_Subsidies.pdf](http://www.g20mexico.org/images/stories/canalfinan/deliverables/energy_markets/Fossil_Fuel_Subsidies.pdf)>.
- GLOBE International. 2013. *The GLOBE Climate Legislation Study: A Review of Climate Change Legislation in 33 Countries*. Third Edition. Townshend T, Fankhauser S, Aybar R, Collins M, Nachmany T, Landesman M and Pavese C (eds.). Available at <[http://www.globeinternational.org/images/climate-study/3rd\\_GLOBE\\_Report.pdf](http://www.globeinternational.org/images/climate-study/3rd_GLOBE_Report.pdf)>.
- IEA. 2012. *World Energy Outlook 2012*. Available at <<http://www.worldenergyoutlook.org/publications/weo-2012/>>.
- ILO. 2012. *Working Towards Sustainable Development: Opportunities for Decent Work and Social Inclusion in a Green Economy*. Geneva: ILO. Available at <[http://www.ilo.org/wcmsp5/groups/public/@dgreports/@dcomm/@publ/documents/publication/wcms\\_181836.pdf](http://www.ilo.org/wcmsp5/groups/public/@dgreports/@dcomm/@publ/documents/publication/wcms_181836.pdf)>.
- IMF. 2013. *Energy Subsidy Reform: Lessons and Implications*. Executive Summary. Available at <<http://www.imf.org/external/np/pp/eng/2013/012813.pdf>>.
- Edenhofer O et al (eds.). 2011. *IPPC Special Report on Renewable Energy Sources and Climate Change Mitigation. Prepared by Working Group III of the Intergovernmental Panel on Climate Change*. Cambridge: Cambridge University Press.
- IRENA. 2012. *Local Government Regulation Ordinances and Laws to Promote Renewable Energy*. Summary. Available at <[http://www.irena.org/Publications/RE\\_Policy\\_Cities\\_CaseStudies/IRENA%20cities%20case%206%20Sao%20Paulo.pdf](http://www.irena.org/Publications/RE_Policy_Cities_CaseStudies/IRENA%20cities%20case%206%20Sao%20Paulo.pdf)>.
- UNEP. 2011a. *HFCs: A Critical Link in Protecting Climate and the Ozone Layer*. A UNEP synthesis report. UNEP. Available at <[http://www.unep.org/dewa/portals/67/pdf/HFC\\_report.pdf](http://www.unep.org/dewa/portals/67/pdf/HFC_report.pdf)>.





UNEP. 2011b. *Near-term Climate Protection and Clean Air Benefits: Actions for Controlling Short-Lived Climate Forcers*. A UNEP synthesis report. Available at <[http://www.unep.org/pdf/Near\\_Term\\_Climate\\_Protection\\_&\\_Air\\_Benefits.pdf](http://www.unep.org/pdf/Near_Term_Climate_Protection_&_Air_Benefits.pdf)>.

UNEP. 2011c. *Bridging the Emissions Gap*. A UNEP synthesis report. UNEP. Available at <[http://www.unep.org/pdf/UNEP\\_bridging\\_gap.pdf](http://www.unep.org/pdf/UNEP_bridging_gap.pdf)>.

UNEP. 2012. *The Emissions Gap Report 2012*. A UNEP synthesis report. UNEP. Available at <<http://www.unep.org/pdf/2012gapreport.pdf>>.

Weischer L and Morgen J. 2012. Climate clubs: can small groups of countries make a big difference in addressing climate change? *Review of European Community and International Environmental Law*. 3(21): pp.177–192.

Yohe GW. 2001. Mitigative capacity – the mirror image of adaptive capacity on the emissions side. *Climate Change*. 49(3): pp.247–262.

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